

Application No. 09/768,747
Amendment "A" dated July 17, 2003
Reply to Office Action mailed April 11, 2003

AMENDMENTS TO THE CLAIMS

By this paper, claims 1-2, 6-9, 12, 14, 16-19, 26, 33-34, 36 and 38 have been amended, claims 11 and 13 have been cancelled, and new claim 39 has been added. Accordingly, claims 1-10, 12 and 14-39 now remain pending, as reflected below.

1. (Currently Amended) In an environment that includes a first-message serverdevice storing first message data and a second-devicemessage client storing second message data, a method of synchronizing for enabling synchronization of the second message data with the first message data, while accounting for one or more update notifications that either may or may not have been received by the second device and while accounting for any differences in how the first device and second device store data, the method comprising:

an act of making a change in the first message data, wherein the change is divided into a first portion and a second portion;

an act of sending a first notification to the second-message clientdevice, the first notification including both the first portion of the change and a first token identifying the first portion of the change;

an act of receiving a synchronization request the first token from the second devicemessage client; and

upon receiving the first token, sending a second notification to the message client, the second notification including both the second portion of the change and a second token identifying the second portion of the change; and

upon failing to receive the first token from the message client, resending the first notification along with the second notification to the message client~~an act of resending the change to the second device if the synchronization request does not include the token.~~

2. (Currently Amended) A method as recited in claim 1 wherein the act of resending the change to the second-devicemessage client includes the act of resending the token to the second-devicemessage client.

3. (Original) A method as recited in claim 1 wherein the act of sending a notification is performed over an unreliable communication channel.

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4. (Original) A method as recited in claim 3 wherein the unreliable communication channel comprises a wireless communication channel.

5. (Original) A method as recited in claim 3 wherein the acts of receiving a synchronization request and resending the change are performed over a reliable communication channel.

6. (Currently Amended) A method as recited in claim 1 wherein the token is unique to the ~~first message server~~ device.

7. (Currently Amended) A method as recited in claim 1, further comprising the act of compressing the token, wherein the compressed token is unique to the ~~second device~~ message device.

8. (Currently Amended) A method as recited in claim 4-12, wherein the ~~first and second server~~ data include at least one of contact data, calendar data, task data, and email data.

9. (Currently Amended) A method as recited in claim 4-12, wherein the ~~first device server~~ comprises a message server and the ~~second device~~ client comprises a message client.

10. (Original) A method as recited in claim 9 wherein the message client comprises one of a portable personal computer, a cellular telephone, a pager, and a personal digital assistant.

11. (Cancelled) A method as recited in claim 1 wherein the notification corresponds to only a portion of the change made in the first data, the method further comprising the act of providing, in response to a request for synchronization that includes the token, any remaining portion of the change made in the first data.

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12. (Currently Amended) In ~~an a computing electronic-messaging-environment~~ that includes a ~~message-server~~ and one or more ~~message-clients~~, a method for enabling synchronization of ~~of synchronizing~~ data stored at the one or more ~~message-clients~~ with data stored at the ~~message-server~~, while accounting for one or more update notifications that either may or may not have been received by the one or more ~~message-clients~~ and while accounting for any differences in how the ~~message-server~~ and the one or more ~~message-clients~~ store data, the method comprising:

an act of making a plurality of changes in the ~~message-server~~ data;

an act of generating a plurality of tokens identifying each of the plurality of changes in the ~~message-server~~ data;

an act of sending a plurality of update notifications to the one or more ~~message-clients~~ over an unreliable communication channel without requesting or receiving acknowledgement of receipt of the update notifications by the one or more clients, each update notification including (i) at least one of the plurality the changes and (ii) at least one of the plurality of tokens, the at least one of the plurality of tokens corresponding to the at least one of the plurality of changes;

an act of receiving a plurality of tokens back from the one or more ~~message-clients~~;

an act of interpreting one or more tokens that were sent to the one or more ~~message-clients~~ but that were not received back from the one or more ~~message-clients~~ as indications that one or more changes are missing from the one or more ~~message-clients~~; and

an act of sending a list of one or more missing tokens to the one or more clients missing the one or more changes, the list identifying one or more tokens that were sent to the one or more clients but that were not received back;

receiving a request from the one or more clients to resend the one or more missing tokens and corresponding changes; and

an act of resending the one or more missing tokens and corresponding changes to the one or more message-requesting clients.

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13. (Cancelled) A method as recited in claim 12, further comprising the act of resending to the one or more message clients one or more tokens identifying the one or more missing changes.

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14. (Currently Amended) A method as recited in claim 12 further comprising:
an act of generating a collection object that comprises a list of tokens, the list representing a state of the data stored at the one or more message clients; and
an act of sending the collection object to the one or more message clients.

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15. (Original) A method as recited in claim 12 wherein the unreliable communication channel comprises a wireless communication channel.

16. (Currently Amended) A method as recited in claim 12, further comprising the act of compressing the plurality of tokens, wherein the act of compressing the plurality of tokens produces a plurality of tokens that are unique to each of the one or more message clients.

17. (Currently Amended) A method as recited in claim 12 wherein the data stored at the message-server includes at least one of contact data, calendar data, task data, and email data and wherein the one or more message clients comprise one of a portable personal computer, a cellular telephone, a pager, and a personal digital assistant.

18. (Currently Amended) A method as recited in claim 12 wherein at least one change made in the message-server data is divided into a first portion and a second portion, and at least one notification corresponds to the first portion, the method further comprising:
an act of receiving back from the one or more message clients, a token associated with the first portion; and
an act of sending the second portion to the one or more message clients in response to receiving back the token associated with the first portion.

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19. (Currently Amended) In an electronic messaging environment that includes a message server and one or more message clients, a method for enabling synchronization of synchronizing data stored at the one or more message clients with data stored at the message server, while accounting for one or more update notifications that either may or may not have been received by the one or more message clients and while accounting for any differences in how the message server and the one or more message clients store data, the method comprising:

a step for providing, over an unreliable communication channel, a plurality of notifications to the one or more message clients without requesting or receiving acknowledgement of receipt of the notifications by the one or more message clients, the plurality of notifications including (i) a plurality of changes to the data stored at the message server, and (ii) a plurality of tokens identifying each of the plurality of changes;

a step for determining whether or not the one or more message clients are missing any of the plurality of notifications based on whether or not the one or more message clients can provide back each of the plurality of tokens identifying each of the plurality of changes; and

an act of sending a list identifying missing notifications to the one or more corresponding message clients;

receiving a request from the one or more message clients to resend the one or more missing notifications; and

an act of resending the one or more missing notifications to the one or more requesting message clients.

~~a step for providing to the one or more message clients, any change associated with a missing notification identified in the step for determining.~~

20. (Original) A method as recited in claim 19 wherein the unreliable communication channel comprises a wireless communication channel.

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21. (Original) A method as recited in claim 19 further comprising a step for providing a collection object to the one or more message clients, the collection object representing a state of the data stored at the one or more message clients.

22. (Original) A method as recited in claim 19 wherein the step for providing any change associated with a missing notification further comprises a step for providing any token associated with a missing notification.

23. (Original) A method as recited in claim 19 further comprising an act of compressing the plurality of tokens to produce tokens that are unique to each of the one or more message clients.

24. (Original) A method as recited in claim 19 wherein the data stored at the message server includes at least one of contact data, calendar data, task data, and email data and wherein the one or more message clients comprise one of a portable personal computer, a cellular telephone, a pager, and a personal digital assistant.

25. (Original) A method as recited in claim 19 wherein at least one change made in the message server data is divided into a first portion and a second portion, and at least one notification corresponds to the first portion, the method further comprising a step for providing the second portion to the one or more message clients in response to receiving a token associated with the first portion.

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26. (Currently Amended) In an electronic messaging environment, a system for enabling synchronization of synchronizing data, while accounting for one or more update notifications that either may or may not have been received by the one or more message clients and while accounting for any differences in how the message server and the one or more message clients store data, the system comprising:

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a message server storing data;

one or more message clients storing data;

an unreliable communication channel at least intermittently connecting the message server and the one or more message clients; and

processor means for performing the acts of:

making a plurality of changes in the message server data;

generating a plurality of tokens identifying each of the plurality of changes in the message server data;

sending a plurality of notifications to the one or more message clients over the unreliable communication channel without requesting or receiving acknowledgement of receipt of the notifications by the one or more message clients, each notification including (i) at least one of the plurality the changes and (ii) at least one of the plurality of tokens, the at least one of the plurality of tokens corresponding to the at least one of the plurality of changes;

receiving a plurality of tokens back from the one or more message clients;

interpreting one or more tokens that were sent to the one or more message clients but not received back from the one or more message clients as indications that one or more changes are missing from the one or more message clients; and

an act of sending a list of one or more missing tokens to the one or more message clients missing the one or more changes, the list identifying one or more tokens that were sent to the one or more message clients but that were not received back;

receiving a request from the one or more message clients to resend the one or more missing tokens and corresponding changes; and

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resending the one or more missing changes to the one or more message clients.

27. (Original) A system as recited in claim 26 further comprising processor means for performing the acts of:

generating a collection object that comprises a list of tokens, the list representing a state of the data stored at the one or more message clients; and
sending the collection object to the one or more message clients.

28. (Original) A system as recited in claim 26 wherein the unreliable communication channel comprises a wireless communication channel.

29. (Original) A system as recited in claim 26 further comprising processor means for resending one or more tokens identifying the one or more missing changes.

30. (Original) A system as recited in claim 26 further comprising processor means for compressing the plurality of tokens, wherein the processor means produces a plurality of tokens that are unique to each of the one or more message clients.

31. (Original) A system as recited in claim 26 wherein the data stored at the message server includes at least one of contact data, calendar data, task data, and email data and wherein the one or more message clients comprise one of a portable personal computer, a cellular telephone, a pager, and a personal digital assistant.

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32. (Original) A system as recited in claim 26 wherein at least one change made in the message server data is divided into a first portion and a second portion, and at least one notification corresponds to the first portion, the system further comprising processor means for performing the acts of:

receiving back from the one or more message clients, a token associated with the first portion; and

providing the second portion to the one or more message clients in response to receiving back the token associated with the first portion.

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33. (Currently Amended) A computer program product for use in an electronic messaging environment that includes a ~~message-server~~ in communication with one or more ~~message-clients~~, the computer program product for implementing a method for enabling synchronization of ~~of synchronizing~~ data stored at the one or more ~~message-clients~~ with data stored at the ~~message-server~~, while accounting for one or more update notifications that either may or may not have been received by the one or more ~~message-clients~~ and while accounting for any differences in how the ~~message-server~~ and the one or more ~~message-clients~~ store data, the computer program product comprising a computer-readable medium having computer-executable instructions for performing the acts of:

- an act of making a plurality of changes in the server data;
 - an act of generating a plurality of tokens identifying each of the plurality of changes in the server data;
 - an act of sending a plurality of update notifications to the one or more clients over an unreliable communication channel without requesting or receiving acknowledgement of receipt of the update notifications by the one or more clients, each update notification including (i) at least one of the plurality the changes and (ii) at least one of the plurality of tokens, the at least one of the plurality of tokens corresponding to the at least one of the plurality of changes;
 - an act of receiving a plurality of tokens back from the one or more clients;
 - an act of interpreting one or more tokens that were sent to the one or more clients but that were not received back from the one or more clients as indications that one or more changes are missing from the one or more clients; and
 - an act of sending a list of one or more missing tokens to the one or more clients missing the one or more changes, the list identifying one or more tokens that were sent to the one or more clients but that were not received back;
 - receiving a request from the one or more clients to resend the one or more missing tokens and corresponding changes; and
 - an act of resending the one or more missing tokens and corresponding changes to the one or more requesting clients.
- identifying a plurality of changes in the message-server data;

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~~generating a plurality of tokens identifying each of the plurality of changes in the message server data;~~

~~causing to be sent, a plurality of notifications to the one or more message clients over an unreliable communication channel, each notification including (i) at least one of the plurality the changes and (ii) a at least one of the plurality of tokens, the at least one of the plurality of tokens corresponding to the at least one of the plurality of changes;~~

~~accumulating a plurality of tokens back from the one or more message clients;~~

~~interpreting one or more tokens that were sent to the one or more message clients but not received back from the one or more message clients as indications that one or more changes are missing from the one or more message clients; and~~

~~causing to be resent, the one or more missing changes to the one or more message clients.~~

34. (Currently Amended) A computer-program product as recited in claim 33 wherein the computer-readable medium further comprises computer-executable instructions for performing the acts of:

~~generating a collection object that comprises a list of tokens, the list representing a state of the data stored at the one or more message clients; and~~

~~causing to be sent, the collection object to the one or more message clients.~~

35. (Original) A computer-program product as recited in claim 33 wherein the computer-readable medium further comprises computer-executable instructions for performing the acts of causing to be resent one or more tokens identifying the one or more missing changes.

36. (Currently Amended) A computer-program product as recited in claim 33 wherein the computer-readable medium further comprises computer-executable instructions for performing the acts of compressing the plurality of tokens, wherein the computer-executable instructions produce a plurality of tokens that are unique to each of the one or more message clients.

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37. (Original) A computer program product as recited in claim 33 wherein the computer-executable instructions of the computer-readable medium process data stored at the message server that includes at least one of contact data, calendar data, task data, and email data.

38. (Currently Amended) A computer-program product as recited in claim 33 wherein at least one change made in the message server data is divided into a first portion and a second portion, and at least one notification corresponds to the first portion, the computer-readable medium further comprising computer-executable instructions for performing the acts of:

receiving back from the one or more message-clients, a token associated with the first portion; and

providing the second portion to the one or more message-clients in response to receiving back the token associated with the first portion.

39. (New) A method as recited in claim 1, wherein each of the first and second portions comprise at least one of an email header portion, email message portion, and email attachment portion.